

## REMARKS

This Response is submitted in reply to the Office Action dated October 26, 2007, in which the Examiner:

rejected claims 1-31 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement;

rejected claim 19 under 35 U.S.C. § 112, second paragraph, as indefinite;

rejected claims 1-5, 9-11, 13-14 and 16-18 under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent Application Publication No. 2004/0011484 to Saviharju et al. in view of WIPO Publication WO 93/11297 to Kuusio et al. and U.S. Patent No. 5,226,927 to Rundstrom as evidenced by U.S. Patent No. 3,607,117 to Shaw et al. and U.S. Patent No. 4,312,702 to Tomlinson II;

rejected claims 6-8, 14-15 and 19-31 under 35 U.S.C. § 103(a) as unpatentable over Saviharju in view of Kuusio and Rundstrom, and further in view of U.S. Patent No. 4,627,173 to O'Hagan et al.; and

rejected claim 12 under 35 U.S.C. § 103(a) as unpatentable over Saviharju in view of Kuusio and Rundstrom, and further in view of U.S. Patent No. 5,103,743 to Berg.

Applicants respectfully traverse these rejections below. Claims 1-31 are currently pending.

Claims 1-31 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement based on the added recitation to independent claims 1, 9 and 19 that the fuel gas is to be fed substantially continuously during the burning of the concentrated liquor in the soda recovery boiler. The Examiner asserts that the Specification does not disclose the added recitation in such a way as to reasonably convey to one skilled in the art that the Applicants had possession of the claimed invention. Applicants respectfully disagree. The invention is directed toward the simplification of the apparatus of a pulp mill, its operation and maintenance, and improved energy efficiency (Abstract). In support of this, Applicants state that, “[T]he greatest improvement is obtained when the heavy fuel oil of

the lime sludge reburning kiln is replaced in accordance with the process with fuel gas (approx. 45%) and the remainder is burned in the soda recovery boiler (approx. 55%)." (Specification, paragraph [0031]). Applicants further state that, "[T]he gas is directed to the recovery unit for the chemicals from pulp cooking, where it is burned together with the concentrated liquor obtained from the waste liquor from digestion." (Specification, paragraph [0037]). Therefore, the Specification discloses that the fuel gas is to be supplied to the soda recovery boiler during the burning of the concentrated liquor. Additionally, Applicants state that, "[I]n a modern pulp mill this means annually the replacement of approximately 20,000 tons with fuel gas. At the Annual level this means approximately 17,500 tons less of detrimental carbon dioxide emissions, and when natural gas is replaced, it means approximately 12,500 tons a year." (Specification, paragraph [0031]). Therefore, Applicants disclose that the present invention improves the energy efficiency of the pulp mill by substantially continuously supplying the fuel gas as described above.

Thus, the Specification adequately discloses the recitation that the fuel gas is fed substantially continuously during the burning of the concentrated liquor in the soda recovery boiler. Accordingly, Applicants respectfully request that the rejection of claims 1-31 under 35 U.S.C. § 112, first paragraph, be withdrawn.

Claim 19 was rejected under 35 U.S.C. § 112, second paragraph, as indefinite, for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. The Examiner asserts that it is unclear how the added recitation of feeding the fuel gas produced from the bark by gasification "substantially continuously during operation of the boiler" further defines or limits the apparatus. Applicants respectfully disagree. The added recitation defines the apparatus' operational characteristics. Since the recitation states that the gas will be supplied substantially continuously, it thus defines the apparatus as one that must be capable of sustaining continued operation, rather than occasional use. Accordingly, Applicants respectfully request that the rejection of claim 19 under 35 U.S.C. § 112, second paragraph, be withdrawn.

Claims 1-5, 9-11, 13-14 and 16-18 were rejected under 35 U.S.C. § 103(a) as unpatentable over Saviharju in view of Kuusio and Rundstrom as evidenced by Shaw and Tomlinson II. A rejection under § 103 is improper unless the Examiner established a *prima facie* case of obviousness. A *prima facie* case of obviousness is not established unless the prior art references, alone or in combination, teach or suggest each and every claim recitation.

Applicants' claim 1 recites a process for production of energy in a pulp mill, according to which process a waste liquor of a cellulose pulp digestion liquor is concentrated, and this concentrated liquor is burned in a soda recovery boiler in the presence of biogenic fuels, thermal energy of flue gases obtained from the burning being recovered, wherein the biogenic fuel used is bark or other similar wood waste, which is dried to a moisture content below 30%, whereafter it is gasified to produce a fuel gas that is fed, at least in part, into the soda recovery boiler substantially continuously during the burning of the concentrated liquor in the soda recovery boiler.

Applicants' claim 9 recites a process for producing energy in a sulfate pulp mill, according to which process wood material used for pulp production is in part digested in cooking liquor to separate fibers from each other, the digested wood material is extracted as black liquor from the separated fibers, the black liquor is concentrated by evaporation, and the concentrated liquor is burned in a soda recovery boiler to regenerate cooking chemicals and to produce heat and electricity by using biogenic fuels, wherein solid biogenic fuel is brought into a gaseous form, formed ash is separated, a significant proportion of the gas is burned in the same boiler, equipped with heat recovery, as the concentrated liquor, and the gas is burned substantially continuously during the burning of the concentrated liquor in the soda recovery boiler.

Saviharju does not teach or suggest each and every recitation of Applicants' claim 1 or 9. For instance, Saviharju does not teach or suggest the burning of a gasified biogenic fuel substantially continuously during the burning of the concentrated liquor in the soda recovery boiler.

Kuusio does not add to the teachings of Saviharju, at least in that Kuusio also does not teach or suggest the burning of a gasified biogenic fuel

substantially continuously during the burning of the concentrated liquor in the soda recovery boiler. Instead, Kuusio teaches gasifying a portion of the waste liquor. (See, e.g., Kuusio, p. 6, lines 1-22.) The gasification of waste liquor does not teach or suggest the gasified biogenic fuel of Applicants' claims 1 and 9, which is gasified "bark or other similar wood waste" (claim 1), or gasified "solid biogenic fuel" (claim 9).

Additionally, Kuusio does not teach or suggest that the gasified waste liquor is burned substantially continuously in the recovery boiler with concentrated waste liquor. Instead, Kuusio teaches that "...the gas can be used as a *starting* fuel in the waste liquor recovery boiler...." (Kuusio, p. 10, line 37 – p. 11, line 1; emphasis added.) Use of the gasified waste liquor as a *starting* fuel does not teach or suggest substantially continuous burning.

Rundstrom does not add to the teachings of Saviharju and Kuusio, at least in that Rundstrom also does not teach or suggest the burning of a gasified biogenic fuel substantially continuously during the burning of the concentrated liquor in the soda recovery boiler. In fact, Rundstrom does not appear to teach anything concerning the fuel supplied to a soda recovery boiler, and thus, does not disclose, teach or suggest anything about the burning of a gasified biogenic fuel substantially continuously during the burning of concentrated liquor in a soda recovery boiler.

Shaw does not add to the teachings of Saviharju, Kuusio and Rundstrom, in that Shaw also does not teach or suggest the burning of a gasified biogenic fuel substantially continuously during the burning of the concentrated liquor in the soda recovery boiler. Instead, Shaw teaches that, "...under normal conditions, black liquor is the only fuel supplied to the boiler 10." (Shaw, col. 3, lines 42-43). Shaw further states that, "[I]n the event the demand for steam exceeds that which can be supplied by burning the available black liquor, auxiliary fuel, such as secondary gas or fuel oil, is supplied to the nozzles 54..." (Shaw, col. 3, lines 54-56). The Examiner erroneously states that this teaches that the gas is supplied substantially continuously during boiler operation. (Office Action, pg. 8). However, Shaw discloses, teaches and suggests that only black liquor is supplied substantially continuously to fuel the recovery boiler, but that if normal operating conditions cannot be maintained, auxiliary fuel can be supplied.

Tomlinson II does not add to the teachings of Saviharju, Kuusio, Rundstrom and Shaw, in that Tomlinson II also does not teach or suggest the burning of a gasified biogenic fuel substantially continuously during the burning of the concentrated liquor in the soda recovery boiler. Instead, Tomlinson II teaches that, "...it is possible to maintain satisfactory operating temperatures throughout the furnace over a considerable range of production rates by adjusting the air supply to correspond to the rate of residual liquor production, if necessary adding oil or gas as an auxiliary fuel." (Tomlinson II, col. 6, lines 11-16). The Examiner incorrectly states that this indicates that gas is burned substantially continuously during the burning of the concentrated liquor in the soda recovery boiler. (Office Action, pg. 8). However, the use of the phrase "if necessary" teaches that the gas is not to be supplied substantially continuously, but only when the temperature cannot be regulated with the air supply alone. Additionally, Tomlinson II teaches away from using a gasified biogenic fuel because, according to Tomlinson II, gas does not distribute itself throughout the bed of the boiler. (Tomlinson II, col. 5-6, lines 67-2). Therefore, Tomlinson II does not teach or suggest the burning of a gasified biogenic fuel substantially continuously during the burning of the concentrated liquor in the soda recovery boiler.

Since Saviharju, Kuusio, Rundstrom, Shaw and Tomlinson II disclose, teach and suggest that auxiliary fuel is not burned in a recovery boiler under normal conditions, but rather only used during startup or when supply air alone cannot regulate temperature, the combination of these references does not teach or suggest the burning of a gasified biogenic fuel substantially continuously during the burning of the concentrated liquor in the soda recovery boiler.

Thus, neither Saviharju nor Kuusio nor Rundstrom nor Shaw nor Tomlinson II, nor the combination thereof, teaches or suggests each and every recitation of Applicants' claim 1 or 9. Accordingly, Applicants respectfully submit that the rejection of claims 1 and 9 under 35 U.S.C. § 103(a) as unpatentable over Saviharju in view of Kuusio and Rundstrom as evidenced by Shaw and Tomlinson II is improper for at least this reason, and should be withdrawn.

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Claims 2-5, 10, 11, 13-14 and 16-18 depend directly from claims 1 and 9 and include additional recitations thereto. Accordingly, Applicants respectfully submit that the rejection of claims 2-5, 10, 11, 13-14 and 16-18 under 35 U.S.C. § 103(a) as unpatentable over Saviharju in view of Kuusio and Rundstrom as evidenced by Shaw and Tomlinson II is improper for at least the reasons associated with claims 1 and 9, and should be withdrawn.

Therefore, rejection of claims 1-5, 9-11, 13-14 and 16-18 under 35 U.S.C. § 103(a) should be withdrawn and claims 1-5, 9-11, 13-14 and 16-18 passed to issue.

Claims 6-8, 14-15 and 19-31 were rejected under 35 U.S.C § 103(a) as unpatentable over Saviharju in view of Kuusio and Rundstrom, and further in view of O'Hagan.

Claims 6-8, 14-15 and 28-31 all depend, directly or indirectly, from one of Applicants' independent claims 1 or 9 and include additional recitations thereto. As stated in connection with claims 1 and 9, neither Saviharju nor Kuusio nor Rundstrom, nor the combination thereof, teaches or suggests each and every recitation of Applicants' claim 1 or 9.

Applicants respectfully submit that O'Hagan does not remedy the deficiencies of Saviharju, Kuusio and Rundstrom as applied to claims 1 or 9, at least in that O'Hagan also does not teach or suggest burning a gasified biogenic fuel substantially continuously during the burning of the concentrated liquor in the soda recovery boiler.

Thus, neither Saviharju nor Kuusio nor Rundstrom nor O'Hagan, nor the combination thereof, teaches or suggests each and every recitation of Applicants' independent claims 1 or 9. Accordingly, Applicants respectfully submit that the rejection of dependent claims 6-8, 14-15 and 28-31 under 35 U.S.C. § 103(a) as unpatentable over Saviharju in view of Kuusio and Rundstrom, and further in view of O'Hagan, is improper for at least this reason, and should be withdrawn.

Applicants' claim 19 recites an apparatus for producing, from wood bark, a biogenic fuel gas to be fed into a recovery boiler of a pulp mill, the apparatus being connected to a feed unit of the recovery boiler, wherein it comprises as a combination a bark-drying unit having feed means for the

bark to be dried and outlet means for the bark, and a dried-bark gasifier for producing fuel gas from the bark, the apparatus having feed means for bark and outlet means for fuel gas, the feed means of the gasifier being connected to the outlet means of the drying unit and the gas outlet means being connected to the feed unit of the recovery boiler to feed into the boiler the fuel gas produced from the bark by gasification substantially continuously during operation of the boiler.

Saviharju does not teach or suggest each and every recitation of Applicants' claim 19. For instance, Saviharju does not teach or suggest gas outlet means being connected to the feed unit of the recovery boiler to feed into the boiler the fuel gas produced from the bark by gasification substantially continuously during operation of the boiler.

Kuusio does not add to the teachings of Saviharju, at least in that Kuusio also does not teach or suggest gas outlet means being connected to the feed unit of the recovery boiler to feed into the boiler the fuel gas produced from the bark by gasification substantially continuously during operation of the boiler.

Rundstrom does not add to the teachings of Saviharju and Kuusio, at least in that Rundstrom also does not teach or suggest gas outlet means being connected to the feed unit of the recovery boiler to feed into the boiler the fuel gas produced from the bark by gasification substantially continuously during operation of the boiler.

O'Hagan does not add to the teachings of Saviharju, Kuusio and Rundstrom, at least in that O'Hagan also does not teach or suggest gas outlet means being connected to the feed unit of the recovery boiler to feed into the boiler the fuel gas produced from the bark by gasification substantially continuously during operation of the boiler.

Thus, neither Saviharju nor Kuusio nor Rundstrom nor O'Hagan, nor the combination thereof, teaches or suggests each and every recitation of Applicants' claim 19. Accordingly, Applicants respectfully submit that the rejection of claim 19 under 35 U.S.C. § 103(a) as unpatentable over Saviharju in view of Kuusio and Rundstrom, and further in view of O'Hagan, is improper for at least this reason, and should be withdrawn.

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Claims 20-27 all depend, directly or indirectly, from independent claim 19 and include additional recitations thereto. Accordingly, Applicants respectfully submit that the rejection of claims 20-27 under 35 U.S.C § 103(a) as unpatentable over Saviharju in view of Kuusio and Rundstrom, and further in view of O'Hagan, is improper for at least the reasons stated in connection with claim 19, and should be withdrawn.

Claim 12 was rejected under 35 U.S.C. § 103(a) as unpatentable over Saviharju in view of Kuusio and Rundstrom, and further in view of Berg. Claim 12 depends directly from claim 9 and includes additional recitations thereto. As stated in connection with claim 9, neither Saviharju nor Kuusio nor Rundstrom, nor the combination thereof, teaches or suggests each and every recitation of Applicants' claim 9.

Applicants respectfully submit that Berg does not remedy the deficiencies of Saviharju, Kuusio and Rundstrom as applied to claim 9, at least in that Berg also does not teach or suggest burning a gasified biogenic fuel substantially continuously during the burning of the concentrated liquor in the soda recovery boiler.

Thus, neither Saviharju nor Kuusio nor Rundstrom nor Berg, nor the combination thereof, teaches or suggests each and every recitation of Applicants' independent claim 9. Accordingly, Applicants respectfully submit that the rejection of dependent claim 12 under 35 U.S.C. § 103(a) as unpatentable over Saviharju in view of Kuusio and Rundstrom, and further in view of Berg, is improper for at least this reason, and should be withdrawn.

Having traversed each and every claim rejection, Applicants respectfully request that the rejection of claims 1-31 be withdrawn, and claims 1-31 be passed to issue.

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Applicants believe that no fees are due in connection with this Response. If any fees are deemed necessary, please charge them to deposit account 13-0235.

Respectfully submitted,

By /Marina F. Cunningham/  
Marina F. Cunningham  
Registration No. 38,419  
Attorney for Applicant(s)

McCormick, Paulding & Huber LLP  
CityPlace II, 185 Asylum Street  
Hartford, CT 06103-4102  
Tel: (860) 549-5290  
Fax: (860) 527-0464